



FORMULA 1 SIMULATIONS WITH THE RACE UP TEAM'S CLOUD-BASED PROJECTS FOR THE FORMULA SAE COMPETITION FOR THE UNIVERSITY OF PADOVA



UNIVERSITÀ
DEGLI STUDI
DI PADOVA

raceup

ADOPTED SOLUTIONS

✓ Cloud Infrastructure

Race Up is the University of Padova's student Formula team: a team taking part in the **Formula SAE** competitions, also known as Formula Student, the **car design competition organized by the Society of Automotive Engineers (SAE)** for universities around the world, where participants have to design, plan and manufacture a racing car. Established in 1981, the competition is now well-established on every continent and is held at prestigious circuits including Hockenheimring, Silverstone and Montmelò. It is sponsored by leading automotive companies. More specifically, the project encourages collaboration between different stakeholders in this field, from **engineers and professors in various university engineering departments** (DII, DEI, DTG) to more than 160 corporate sponsors which – through their involvement in this kind of project – have a preferential channel for identifying talented individuals with "hard" skills in the automotive world.

Requirements

Race Up is participating in Formula SAE with two single-seaters, one electric and one with internal combustion. Every racing car entered in the competition is assessed in turn, both from a technical and economical perspective as well as in terms of performance; a process which demands a highly innovative and flexible working environment. Specifically, it is vital to make sure that:

- ✓ the results of simulations are shared between all members in real time;
- ✓ powerful, reliable and effective hardware is universally available;
- ✓ server licenses for the software

are included in the Private Cloud;

- ✓ efficiency is enhanced thanks to the ability to produce simulations on servers and design on the computers of each member of the team;
- ✓ there is access to telemetric data at all times and from any location.

A **highly flexible** solution is required to enable engineers and professionals to **have all the resources needed** to find data and information useful in the different simulations and planning stages, **easily and from any location**.

The solution

The Private Cloud solution provided offers an enterprise-level service, fully compliant with industry standards, capable of designing complex architectures and resources for exclusive use, which would not be possible in public environments. On the Cloud platform it is possible to

perform various **simulations**, from those relating to the **aerodynamic components of the vehicle**, to those relating to the car's **structural components**. It is also possible to collect telemetric data – which is essential for carrying out specific research – and to **view this data live**.

The benefits

One of the most valuable and beneficial features of the project is that it provides a **platform with exclusive use of resources**, which can be accessed by all participants to make their own contribution, from anywhere in the world. This solution makes it possible to create

Virtual Data Centers – with virtual servers, firewalls and networks – with the ability to expand or reduce resources: meaning that the Cloud can be used with total flexibility according to the specific project requirements, for example on the basis of each of the aerodynamic simulations.

Another benefit is data security: the reliability of the service itself, which consists in an infrastructural architecture boasting HA (High Availability), and the application of data protection and confidentiality, guarantees security.

Being able to work in private Cloud environments, provided by certified data centers in an Italian network, offers data security and location guarantees, essential for compliance with European legislation.

“Formula Student encourages very diverse innovation. In many ways Formula Student has the potential to be more innovative than FORMULA 1.”

Ross Brawn, Formula Student Patron

